

We claim:

1. A device for compressing the chest of a patient comprising:

a belt adapted to extend at least partially around the chest of the patient and fastened on the patient;

5 belt tensioning means operably connected to the belt for repeatedly tightening and loosening the belt around the chest of the patient;

10 a motor operably connected to the belt tensioning means, said motor capable of operating the belt tensioning means repeatedly to cause the belt to tighten about the chest of the patient and loosen about the chest of the patient;

a brake operably connected to the belt tensioning means and capable of holding the belt tensioning means in a tightened state about the chest of the patient;

15 a controller for controlling operation of the motor and brake, said controller programmed to operate the motor and brake to cause repeated cycles of tightening of the belt to a set threshold of tightness, momentarily hold the belt at this threshold of tightness, and release the  
20 belt.

2. A device for compressing the chest of a patient comprising:

a belt adapted to extend around the chest of the patient and fastened on the patient;

25 a drive spool operably connected to the belt and adapted to rotate and take up the belt;

a motor operably connected to the drive spool, said motor capable of operating the drive spool repeatedly to cause the belt to tighten about the chest of the patient and loosen about the chest of the patient;

5 a brake operably connected to the drive spool and capable of preventing the drive spool from rotating;

10 a controller for controlling operation of the motor and brake, said controller programmed to operate the motor and brake to rotate the drive spool to cause repeated cycles of tightening of the belt to a set threshold of tightness, momentarily hold the belt at this threshold of tightness, and release the belt.

3. A device for compressing the chest of a patient comprising:

15 a belt adapted to extend around the chest of the patient and fastened on the patient;

a drive spool operably connected to the belt and adapted to rotate and take up the belt;

20 a motor operably connected to the drive spool, said motor capable of operating the drive spool repeatedly to cause the belt to tighten about the chest of the patient and loosen about the chest of the patient;

a brake operably connected to the drive spool and capable of preventing the drive spool from rotating;

25 a controller for controlling operation of the motor and brake, said controller programmed to operate the motor and brake to rotate the drive spool to cause repeated cycles of tightening of the belt and prevent the drive

spool from rotating at selected points in the repeated cycles.

4. The device of claim 1 wherein the brake is further characterized in that it is operable to engage the belt tensioning means at any point in the movement of the belt tightening means.

5. The device of claim 2 wherein the brake is further characterized in that it is operable to engage the drive spool at any point in the movement of the drive spool.

10 6. The device of claim 3 wherein the brake is further characterized in that it is operable to engage the drive spool at any point in the movement of the drive spool.

7. The device of claim 1 wherein the brake is further characterized in that the brake is operable to continuously slow the movement of the belt tensioning means.

8. The device of claim 2 wherein the brake is further characterized in that the brake is operable to continuously slow the movement of the drive spool.

9. The device of claim 3 wherein the brake is further characterized in that the brake is operable to continuously slow the movement of the drive spool.

20 10. The device of claim 1 wherein the controller is programmed to determine the threshold of tightness based on the initial condition of the belt when extended around the chest of the patient.

25 11. The device of claim 2 wherein the controller is programmed to determine the threshold of tightness based on the initial

condition of the belt when extended around the chest of the patient.

12. The device of claim 1 wherein the threshold of tightness is determined based on the maximum acceptable torque to be applied  
5 by the belt compression means to the belt during operation of the device.

13. The device of claim 2 wherein the threshold of tightness is determined based on the maximum acceptable torque to be applied by the motor to the drive spool during operation of the device.

10 14. The device of claim 1 wherein the threshold of tightness is determined based on the maximum acceptable take-up of the belt during operation of the device.

15. The device of claim 2 wherein the threshold of tightness is determined based on the maximum acceptable take-up of the belt  
15 during operation of the device.

16. The device of claim 1 wherein the threshold of tightness is determined based on the measured size of the patient and the allowable change to the circumference of the patient's chest.

17. The device of claim 2 wherein the threshold of tightness is  
20 determined based on the measured size of the patient and the allowable change to the circumference of the patient's chest.